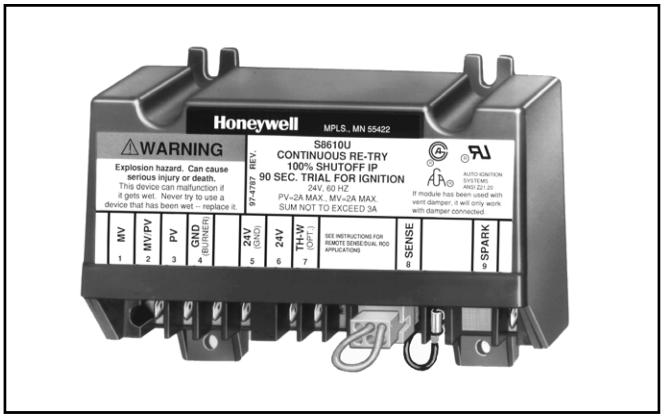
S8610U
Universal Intermittent Pilot Module

PRODUCT DATA



APPLICATION

The S8610U Universal Replacement Ignition Module is designed to provide easy field replacement of a wide range of intermittent pilot ignition modules manufactured by Honeywell, Robertshaw, Johnson and others. The S8610U Module provides ignition sequence, flame monitoring, and safety shutoff for intermittent pilot central furnaces, residential boilers, and other heating appliances.

FEATURES

- **Provides up to 1.0A pilot and 2.0A main valve current rating.**
- **System uses rectification principle for flame sensing.**
- **For use with separate igniter and sensor or combination igniter-sensor. Q345, Q348, Q362, Q373 or Q381 Igniter-sensor recommended as combination igniter-sensor; Q179C with igniter and sensor mounted on one bracket, or Q354 Sensor with Q345, Q348, Q362, Q373 or Q381 Igniter-sensor recommended as separate igniter and sensor.**
- **Q3450/Q3480 Hot Surface Pilot hardware plugs directly into system control.**
- **Can be used on natural or LP gas; provides 100 percent shutoff on ignition failure. Waits six minutes nominal following shutoff, then reinitiates the pilot ignition sequence. The ignition trial-shutoff-wait cycle repeats until the pilot lights or the call for heat ends.**
- **Replaces numerous Honeywell and competitor modules.**
- **Capacitive discharge spark output.**
- **Temperature rating is -40°F to 175°F (-40°C to 79°C) when used with 1.0A or less main valve; -40°F to 165°F (-40°C to 74°C) when used with 1.0 to 2.0A main valve.**

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SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, units may not exactly match the listed specifications Also, units are tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.

SUPER TRADELINE® Models

SUPER TRADELINE® models are selected and packaged for ease of handling, ease of stocking, and maximum replacement value. SUPER TRADELINE® model specifications are the same as those of standard models except as noted.

SUPER TRADELINE® Model Available:
S8610U Universal Intermittent Pilot Module.

Electrical Ratings:
Voltage: 24V, 60 Hz.
Current Draw: 1A pilot valve, 2A main valve.
Valve Contact Rating: 0.2A.

Trial for Ignition:
90 seconds maximum, then 100% shutoff (pilot and main gas).

Continuous Retry:
Five-minute minimum (six-minute nominal) delay if pilot fails to light during trial for ignition. After delay, trial for ignition is repeated. This sequence (trial, delay, trial, delay) continues until pilot lights or call for heat ends.

Spark Generator Output:
13 kV peak at 25 pF load.

Thermostat Anticipator Setting:
0.2A plus pilot valve rating plus main valve rating.

Ambient Temperature Rating:
-40°F to +175°F (-40°C to +79°C) with main valve rated 1.0A or less.
-40°F to +165°F (-40°C to +74°C) with main valve rated 1.0A to 2.0A.

Relative Humidity Rating:
5 to 90% RH at 95°F.

Flame Failure Response Time:
0.8 sec at 1.0 mA flame current.

Terminals:
SENSE: 3/16 in. male quick connect.
All Other Terminals Including Ignition: 1/4 in. male quick connects. Molex plug for connection to Honeywell D80D or D892 Vent Damper.

Flame Current:
1 uA minimum.

Mounting:
Mounts in any position except with terminals up. However, recommended mounting position is with terminals down to provide maximum protection from dripping water or dust accumulation. Fasten with no. 6-32 machine or no. 8 sheetmetal screws of appropriate length. See Fig. 1.

Underwriters Laboratories Inc. Component Recognized:
File no. MH15564, Guide no. MCCZ2.

IAS Design Certified: C2030011.

Other System Components

These modules provide operating control of an intermittent pilot system. Additional components required to complete the system must be ordered separately:

- Dual valve combination gas control designed for intermittent pilot.
- Combination pilot burner/igniter-sensor or separate igniter and sensor on pilot burner bracket.
- Ignition cable.
- Transformer.
- 24V thermostat.
- High limit and other auxiliary controls, as required.

Dual Valve Combination Gas Control:
Any that meet current ratings listed below. VR8204, VR8440 or VR8520 are recommended.
S8610U: 1.0A pilot, 2.0A main valve.

Pilot Burner/Igniter-Sensor:
See Table 1.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number, or specify:

1. SUPER TRADELINE® order number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Logistics
   Honeywell Inc., 1885 Douglas Drive North
   Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.
International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

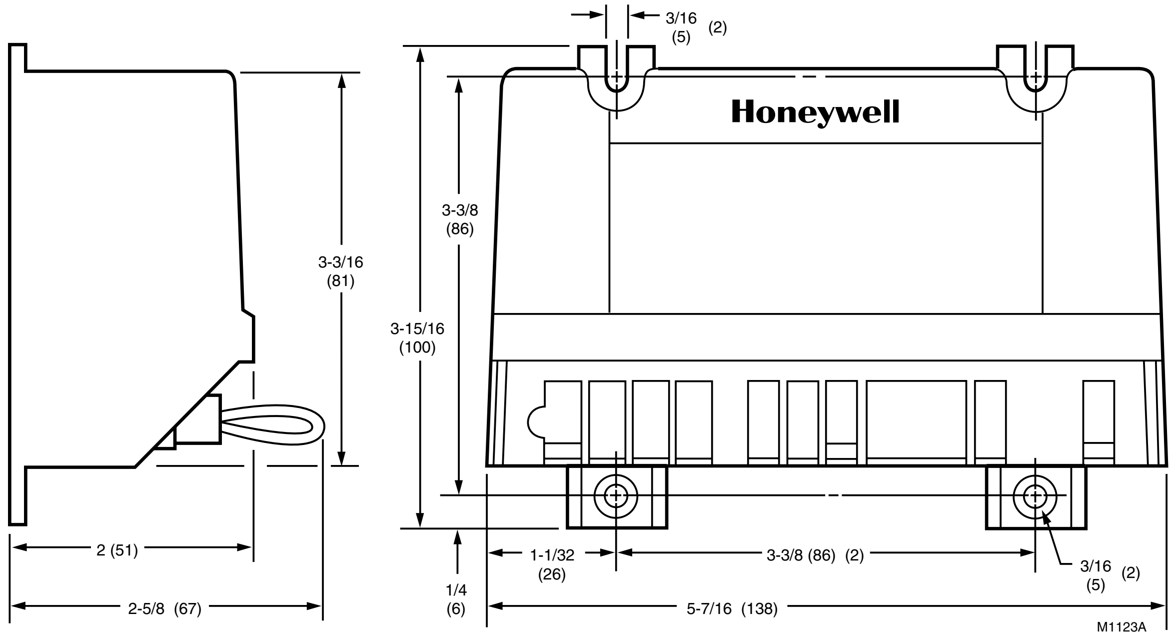


Fig. 1. Approximate ignition module dimensions in in. (mm).

Table 1. Pilot Burner/Igniter-Sensors.

	Pilot Burner/ Igniter-Sensor	Flow Rate*	
		cfh	m^3/hr
Combined	Q345	0.8	0.02
	Q348	1.5	0.04
	Q362	0.5	0.014
	Q373	0.8	0.02
	Q381	0.5	0.014
Separate	Q179C	1.8	0.05
	Q354 with Q345, Q348, Q362 or Q381.		

*With natural gas at 7.0 in. wc (1.7 kPa).

Ignition Cable:
Use Honeywell preassembled cable, see Table 2, or assemble locally. Use the cable recommended in Table 3 (or equivalent), insulated female 1/4 in. quick connect and insulated Rajah connector receptacle. Maximum recommended length is 36 in. (914 mm).

Table 2. Honeywell Preassembled Ignition Cables (UL Style 3257).

Cable Part Number	Length	Module End	Igniter End
394800-30	30 in.	1/4 in. quick connect, insulated	Rajah connector receptacle, 90 degree rubber boot
394801-30	30 in.	1/4 in. quick connect, insulated	Rajah connector receptacle, straight rubber boot

Table 3. Recommended Ignition Cable for Field Assembly.

Cable Type	Voltage Rating (rms)	Temperature Rating	
		°C	°F
UL Style 3217	10,000	150	302
UL Style 3257	10,000	250	484

Transformer:
Add current ratings of module, pilot valve, main valve, vent damper and any other components of the control system to determine transformer-size requirement. Use a 30 VA or larger transformer if a vent damper will be connected to the S8610U Vent Damper Connector.

Thermostat:
Use open-close switch type, or independently-powered electronic, 24V thermostat capable of switching rated control system load. Before using electronic thermostat powered through the heating/cooling controls, consult thermostat manufacturer to assure proper control system operation.

High Limit and Other Auxiliary Controls:
As specified by the heating appliance manufacturer.

Ignition Modules Replaced

⚠ WARNING

Check Table 4 before replacing an existing intermittent pilot module with the S8610U. If the existing module is not listed, do not use the S8610U to replace it unless you are certain the specifications of the S8610U match those of the existing module.

The S8610U replaces existing flame rectification type intermittent pilot ignition modules with the following characteristics:
- Single rod (local sense) or two rod (remote sense) flame sensing.
- Non-100 percent shutoff, 100 percent shutoff/lockout, or 100 percent shutoff/continuous retry.
- Natural or LP gas.
- Shutoff/lockout times of 30 seconds or longer.
- Prepurge times of four seconds or shorter.
- Pilot burners with flow rates of 1500 Btuh or less.
- With or without vent dampers.

A complete list of the specific Honeywell and other modules that the SUPER TRADELINE® S8610U is designed to replace is provided in Table 4.

The S8610U SUPER TRADELINE® package contains complete, easy-to-use instructions, plus the accessories required to adapt the existing spark cable (Rajah, stud, nail, or other) to the spark terminal on the S8610U. It also provides labels to help assure proper marking of the wires attached to the existing module.

The S8610U SUPER TRADELINE® Universal Module is not designed to replace controls with the following characteristics:
- Flame sensing other than by flame rectification (White Rodgers Cycle-Pilot®, Robertshaw thermal sensing).
- Flame rectification modules with shutoff/lockout times of less than 30 seconds, prepurge times of more than four seconds, or pilot burners larger than 1500 Btuh.
- Standing pilot appliances.

Honeywell provides additional control packages to accomplish these replacements. See the Honeywell Electronic Ignition Service Manual, form 70-6604, or call your Honeywell wholesaler.

PLANNING THE INSTALLATION

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY OR DEATH.
Follow these warnings exactly:
1. Plan the installation as outlined below.
2. Plan for frequent maintenance as described in the Maintenance section.

When intermittent pilot systems are used on central heating equipment in barns, greenhouses, and commercial properties and on heating appliances such as commercial cookers, agricultural equipment, industrial heating equipment and pool heaters, heavy demands are made on the controls. Special steps may be required to prevent nuisance shutdowns and control failure due to frequent cycling, severe environmental conditions related to moisture, corrosive chemicals, dust or excessive heat. These applications require Honeywell Home and Building Control Engineering review; contact your Honeywell Sales Representative for assistance.

Review the following conditions that could apply to your specific installation and take the precautionary steps suggested.

Frequent Cycling

These controls are designed for use on appliances that typically cycle three to four times an hour only during the heating season only. In year-round applications with greater cycling rates, the control can wear out more quickly. Perform a monthly checkout.

Water Or Steam Cleaning

If a module or gas control gets wet, replace it. If the appliance is likely to be cleaned with water or steam, protect (cover) the controls and wiring from water or steam flow. Mount the controls high enough above the bottom of the cabinet so they do not get wet during normal cleaning procedures. Use a NEMA 4 enclosure for the ignition module; see the Electronic Ignition Service Manual, form 70-6604.

High Humidity or Dripping Water

Dripping water can cause the module to fail. Never install an appliance where water can drip on the controls.
In addition, high ambient humidity can cause the gas control to corrode and fail.

If the appliance is in a humid atmosphere, make sure air circulation around the controls is adequate to prevent condensation. Also, regularly check out the system. A NEMA 4 enclosure is recommended for the ignition module; see the Electronic Ignition Service Manual, form 70-6604.

Corrosive Chemicals

Corrosive chemicals can attack the module and gas control, eventually causing a failure. If chemicals are used for routine cleaning, make sure they cannot reach the controls. Where chemicals are suspended in air, as in some industrial or agricultural applications, use a NEMA 4 enclosure for the ignition module; see the Electronic Ignition Service Manual, form 70-6604.

Dust or Grease Accumulation

Heavy accumulations of dust or grease can cause controls to malfunction. Where dust or grease can be a problem, provide covers for the module and the gas control to limit contamination. A NEMA 4 enclosure is recommended for the ignition module; see the Electronic Ignition Service Manual, form 70-6604.

Heat

Excessively high temperatures can damage controls. Make sure the maximum ambient temperature at the control does not exceed the rating of the control. If the appliance operates at very high temperatures, use insulation, shielding, and air circulation, as necessary, to protect the controls. Proper insulation or shielding should be provided by the appliance manufacturer; verify that proper air circulation is maintained when the appliance is installed.

Table 4. S8610U Replaces these Ignition Modules.

CAMSTAT	S86H1089	CSA42A-604R	G60PAG-6	G60RCG-2	G67AG-7
IPI-24-00	S86H1097	CSA43A-600R	G60PAJ-1	G60RCJ-1	G67AG-8
	S86H1105	CSA44A-600R	G60PAK-1	G60RDG-1	G67BG-2
FENWAL	S86H1121	CSA45A-601R	G60PAK-2	G60RDK-1	G67BG-3
05-203025-005	S86H1147	CSA45A-602R	G60PFH-1	G60RGL-1	G67BG-4
05-203026-005	S90A100	CSA46A-600R	G60PFH-2	G60RHL-1	G67BG-5
	S90B1003	CSA48A-600R	G60PFL-1	G60RHP-1	G67MG-1
HONEYWELL	S90B1011	CSA49A-600R	G60PFQ-1	G60RPL-1	G67MG-4
S86A1001	S8600A1001	CSA49A-605R	G60PVL-1	G60RSL-1	G67NG-2
S86A1019	S8600B1009	CSA51A-601R	G60QAG-2	G60ZAG-1	G600AX-1
S86A1027	S8600C1015	CSA52A-600R	G60QAG-3	G65BBG-1	G600AY-1
S86A1035	S8600F1000	G60AAA-1	G60QAK-1	G65BBG-2	G600MX-1
S86B1009	S8600F1034	G60AAG-1	G60QBG-1	G65BBG-3	G600NX-1
S86B1017	S8600F1042	G60AAG-3	G60QBG-2	G65BBG-4	G600RX-1
S86B1025	S8600H1006	G60AAG-4	G60QBG-3	G65BBG-5	G670AW-1
S86C1007	S8600H1022	G60AAG-5	G60QBG-4	G65BBG-6	G770MGA-1
S86C1015	S8600H1048	G60AAG-6	G60QBG-5	G65BBG-7	G770MGA-2
S86C1031	S8600H1055	G60CAA-1	G60QBG-6	G65BBG-8	G770MGC-1
S86C1049	S8600H1089	G60CAA-3	G60QBG-7	G65BBM-1	G770MGC-2
S86C1056	S8600H1105	G60CAG-1	G60QBG-8	G65BBM-2	G770MGC-3
S86D1005	S8600M1005	G60CAG-2	G60QBG-9	G65BBM-3	G770MHA-1
S86D1021	S8600M1013	G60CAG-3	G60QBH-1	G65BBM-4	G770NGA-1
S86E1002	S8610A1009	G60CAG-4	G60QBK-1	G65BCG-1	G770NGC-4
S86E1010	S8610B1007	G60CAG-5	G60QBK-3	G65BCM-1	G770NGC-5
S86E1028	S8610B1015	G60CAG-6	G60QBL-1	G65BFG-1	G770NGC-6
S86E1036	S8610C1005	G60CAG-7	G60QBL-2	G65BFM	G770NGC-7
S86E1044	S8610F1008	G60CAG-8	G60QCG-1	G65BKG-1	G770RGA-1
S86E1051	S8610F1016	G60CAG-9	G60QCJ-1	G65BKG-2	G770RHA-1
S86E1069	S8610F1024	G60CBA-1	G60QCL-1	G65BKG-3	G770MHA-2
S86E1077	S8610F1032	G60CBA-3	G60QDG-1	G65BKM-1	G770MHC-1
S86E1101	S8610H1012	G60CBG-1	G60QFL-1	G65BKM-2	G770NHA-1
S86E1119	S8610H1038	G60CBG-10	G60QHL-1	G65BKM-3	G770NHC-1
S86E1127	S8610H1046	G60CBG-11	G60QJL-1	G65DBG	G770RHA-2
S86F1000	S8610H1053	G60CBG-14	G60QLG-1	G65DBM-1	
S86F1018	S8610H1079	G60CBG-16	G60QPL-1	G65DBM-3	
S86F1026	S8610M1003	G60CBG-17	G60QRH-1	G65DCM-1	
S86F1042	S8610M1029	G60CBG-3	G60QRL-1	G65DFG	**ROBERTSHAW**
S86F1059	S8620H1028	G60CBG-4	G60QRL-2	G65DFM-1	780-715
S86F1067		G60CBG-9	G60QRL-3	G65DKG	780-735
S86F1075	**HSC**	G60CCA-1	G60QSL-1	G65DKM	780-737
S86F1083	1003-3	G60CCG-1	G60QTH-1	G65FBG	SP715
S86F1091	1003-300	G60CPG-1	G60QTL-1	G65FFG	SP715A
S86G1008		G60DBG-1	G60RAG-1	G65FKG	SP735
S86G1016	**PENN-**	G60DCG-1	G60RAK-1	G66AG-1	SP735D
S86G1032	**JOHNSON**	G60DCG-2	G60RBG-1	G66BG-1	SP735L
S86G1057	CSA35A-617R	G60PAG-1	G60RBG-2	G66MG-1	USI 715U
S86G1073	CSA35A-618R	G60PAG-2	G60RBG-3	G66NG-1	
S86H1006	CSA42A-600R	G60PAG-3	G60RBK-1	G67AG-3	
S86H1022	CSA42A-601R	G60PAG-4	G60RBK-2	G67AG-4	
S86H1048	CSA42A-603R	G60PAG-5			

INSTALLATION

1. Read these instructions carefully. Failure to follow them could damage the components or cause a hazardous condition.
2. Check the ratings given in the instructions and on the components to make sure they are suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out component operation as provided in these instructions.

⚠ WARNING

FIRE OR EXPLOSION HAZARD CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH.

1. If it gets wet, the ignition module can malfunction, leading to accumulation of explosive gas.
   - Never install where water can flood, drip or condense on the module.
   - Never use a module that has been wet. Replace it.
2. Liquefied petroleum (LP) gas is heavier than air and will not vent upward naturally.
   - Do not light the pilot or operate electric switches, lights or appliances until you are sure the appliance area is free of gas.
3. Do not attempt to disassemble or clean the module. Improper reassembly and cleaning can cause unreliable operation.

⚠ CAUTION

1. Disconnect the power supply before beginning the wiring to prevent electrical shock or equipment damage.
2. If a new gas control is to be installed, turn off the gas supply before starting the installation. Conduct a Gas Leak Test according to the gas control manufacturer instructions after the gas control is installed.
3. If the module must be mounted near moisture or water, provide a suitable waterproof enclosure.
4. Using the wire labels provided, label all wires before they are disconnected. Wiring errors can cause improper appliance operation and dangerous conditions such as bypassing safety features.

Perform Preinstallation Safety Inspection

The preinstallation checks described in ANSI Standard Z21.71 in Exhibit A must be done before the replacement module is installed. If a condition is detected that could result in unsafe operation, the appliance should be shut off and the owner advised of the unsafe condition. Correct any potentially unsafe condition before proceeding with the installation.

Remove Old Module

Disconnect power supply before doing any work on the unit. Disconnect and tag the wires from the old module using the wire labels provided. Remove the old module from its mounting location.

Mount New Ignition Module

We recommend mounting the S8610U Module in the same location as the old module, if possible. Otherwise, select a location close enough to the burner to allow a short (3 ft (0.9m) maximum) direct cable route to the igniter. Ambient temperature at the module must be within the range listed in the Specifications section.

Mount the module with the terminals pointing down to protect them from dripping water and dust. The module can also be mounted with the terminals on either side. Do not mount with terminals pointing up. Refer to Fig. 2 for mounting recommendations. When it is necessary to drill new mounting holes, use the S8610U as a template to mark the mounting hole pattern. Drill new holes as required. Fasten securely with four no. 6-32 machine or no. 8 sheetmetal screws.

Wire the Module

⚠ CAUTION

1. Check the wiring diagram furnished by the appliance manufacturer, if available, and compare with Tables 5 through 8. Carefully follow any special instructions affecting the general procedures outlined below.
2. Disconnect the power supply before making wiring connections to prevent electrical shock or equipment damage.

IMPORTANT

1. A common ground is required on:
   a. The pilot burner mounting bracket, and
   b. The GND (BURNER) terminal on the ignition module. Failure to use the GND (BURNER) terminal can result in intermittent loss of spark and/or loss of flame current sensitivity.

2. Make sure the transformer has adequate VA. The ignition module requires at least 0.2A at 24 Vac. Add the current draws of all other devices in the control circuit, including the pilot and main valves in the gas control, and multiply by 24 to determine the total VA requirement of these components. Add this total to 4.8 VA (for the ignition module). The result is the minimum transformer VA rating. Use a Class II transformer when replacement is required.

3. When a vent damper is connected to the S8610U vent damper connector, be sure the system transformer delivers at least 30 VA. The S8610U has an internal fuse that is intended to prevent appliance lightoff if the vent damper is not in place or wired properly. Using a small transformer can interfere with the proper operation of the fuse and bypass the intended safety feature.

❶ Connect the wires to the S8610U Ignition Module as shown in Tables 5 through 8. Make sure that adequate system ground is provided as indicated in the wiring tables.

❷ Verify the thermostat anticipator setting as explained in the IMPORTANT above.

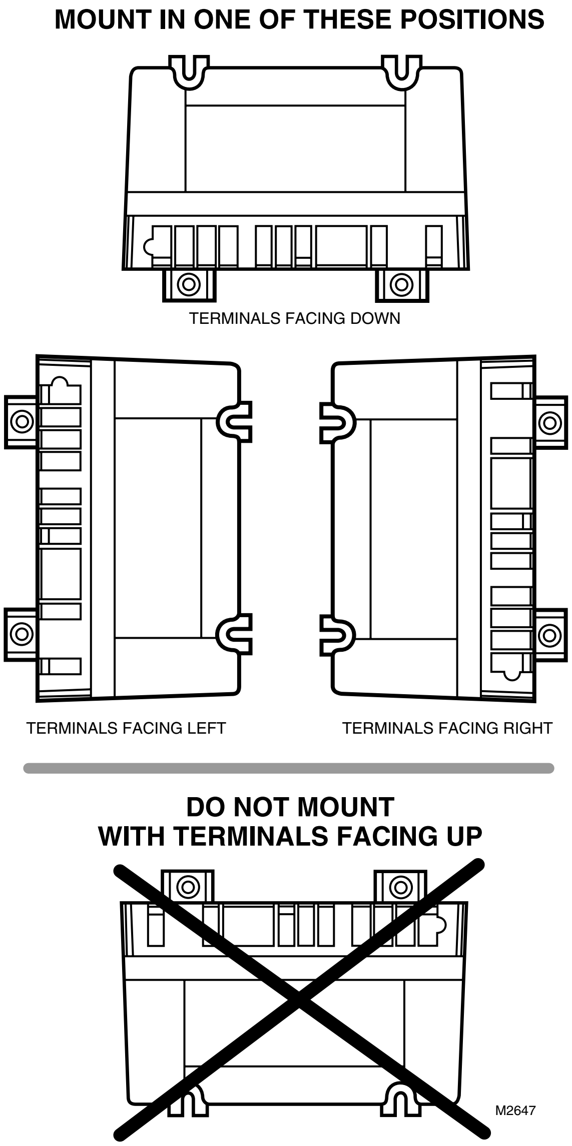


Fig. 2. Module mounting recommendations.

NOTE: The wiring diagrams in Fig. 5 through 8 show typical hookups for the S8610U Ignition Module and should be used for reference only.

Modify Ignition Cable, If Necessary

Use existing ignition cable if it is in good condition. If the existing ignition cable does not have a 1/4 in. quick-connect on the module end, either use the Rajah adapter or strip the wire and replace with the 1/4 in. insulated quick-connect supplied. If the cable must be replaced, order a Honeywell ignition cable, see Table 2. It may be necessary to replace the connector at the pilot burner end to match the pilot burner spark termination.

NOTE: When using an S8610U to replace an S86, use the enclosed adapter to convert the S86 Ignition Cable to an S8610U Ignition Cable. Then, install the adapter and cable to the S8610U Ignition Module.

NOTE: The cable must not run in continuous contact with a metal surface or spark voltage is greatly reduced. Use ceramic or plastic standoff insulators as required.

Table 5. Conversion from Honeywell S86, S90, S8600 and S8610 to S8610U1003.

Terminal Function	Replacement Control	Old Control					Procedural Notes
	S8610U1003	S86A,C	S86B,D	S86E,F,G,H	S8600A,B,C S8610A,B,C S90A,B	S8600F,H,M S8610F,H,M	
Main valve operator	MV	MV	MV	MV	MV	MV	
Main valve and pilot common	MV/PV	MV/PV	MV/PV	MV/PV	MV/PV	MV/PV	
Pilot valve operator	PV	PV	PV	PV	PV	PV	
Burner ground connection	GND (BURNER)	GND	GND	GND (BURNER)	GND (BURNER)	GND (BURNER)	
Transformer secondary (unswitched leg)	24V GND	25V (1)	25V (GND)	25V (1)e	24V GND	24V GND	
Transformer secondary (switched leg)	24V*	25V (2)	25V	25V (2)e*	24V*	24V*	* ***Important:*** If the old module had a vent damper plug but a vent damper was not installed, or if it did *not* have a vent damper plug: leave the vent damper plug in position on the S8610 and connect the 25V (2) or 24V wire from the old module to the TH-W terminal on the S8610U. ***Do not use the 24V terminal on the S8610U.*** If the old module *had* a vent damper with a plug connection to a Molex connector, wire the terminals as indicated in the table.
				25V (2) or 24V used only in systems where plug-in cable connects damper to module.			
	TH-W	TH-R[a]	TH-R[a]	TH-R[a]	TH-W (This terminal not included on S90.)	TH-W	
		TH-W[b]	TH-W	TH-W[b]			
Flame sensor	SENSE [f]	d	d	d	SENSE[f]	d	
Igniter/sensor	SPARK	IGN COIL[c]	IGN COIL[c]	IGN COIL[c]	SPARK	SPARK	

a If 25V (2) and TH-R have wires connected, disconnect and splice together with solderless connector.
b If TH-R and TH-W are jumpered together, connect 25V (2) lead from S86 to TH-W on S8610U1003.
c Use Rajah to quick connector adapter (supplied) or cut Rajah connector off ignition cable at module end; attach insulated quick connect for connection to S8610.
d Leave black jumper connected.
e Terminals may be marked 25V on some models and 24V on later models. These are functionally equivalent.
f On dual igniter and sensor models, remove jumper quick connect from S8610U1003 Sense terminal, cut jumper wire at circuit board, and discard.

Table 6. Conversion from Robertshaw SP715 and SP735 to S8610U1003 (includes 780-XXX and US1715U).

Terminal Function	Replacement Control	Old Control SP715 and SP735 (includes 780-XXX and USI 715U)[c,d]			Procedural Notes
	Honeywell S8610U1003	7000D Valve	7100D Valve	7100K Valve	
Main valve operator	MV	MV (to: Valve TH)	MV (to: Valve M)	MV (to: Valve TR)	—
Main valve and pilot common	MV/PV	MV/PV (to: Valve TR)	MV/PV (to: Valve C)	PV (to: Valve C and TH)	—
Pilot valve operator	PV	PV (to: Valve PILOT)*	PV (to: Valve P)	PV (to: Valve PICK & HOLD)	*This is the terminal not jumpered to TR.
Burner ground connection	GND (BURNER)	GND	GND	GND	—
Transformer secondary	24V GND	TR	TR	TR	—
(unswitched leg)	24V	No connection	No connection	No connection	—
Transfomer secondary (switched leg)		E3[a]	E3[a]	E3[a]	When supplied, E3 provides connection to Lockout Timer.
	TH-W	TH	TH	TH	If LO-15 is part of the installation, use the wire disconnected from E1 tagged *Thermostat*.
Flame sensor	SENSE[b]	SENSE[e]	SENSE[e]	SENSE[e]	—
Pilot igniter	SPARK	IGN	IGN	IGN	—

1. Use existing wiring harness to make connections to S8610 per table. ***IMPORTANT*** *If installation includes LO-15 Lockout Timer, discard wires to E3 and TH.* Disconnect and retain wire to LO-15 terminal E1. Tag wire, *Thermostat*. Discard LO-15.
2. On 7000D series valve, retain (or install) white jumper between valve TR and pilot solenoid.

a If LO-15 Lockout timer is not installed, E3 connector provided on SP715 is not used.

b ***Important***
If the USI 715U with combination igniter sensor is not used, remove black jumper quick connect from Sense terminal of S8610U1003. Cut jumper wire at circuit board and discard.

c For replacement of Robertshaw *Flame Switch* systems (SP710, 720, 730, 750, 780-700, 780-701, 780-710, 780-711, 780-712 and 780-713), see Honeywell Ignition Control Handbook.
d 780-715 and USI 715U are equivalent to SP715; 780-735 and 780-737 are equivalent to SP735. For other 780-XXX models, see note[c].
e OPT. SENSOR on USI 715U. No external connection if combination igniter sensor is used.

Table 7. Conversion from Penn-Johnson CSA (All), G60, G66, G67, G600, G670 or G770 to S8610U1003.

Terminal Function	Replacement Control	Old Control				Procedural Notes
	Honeywell S861U1003	CSA45A-600R[d], G60, G65, G66, G67, G600 or G670 Installation with Lockout Modules as follows:*			G770	
		None (Y79)	Y79A module[d]	Y79B module[c]		
Main valve operator	MV	3	3	Y79B MV	MV (3)	
Main valve and pilot common	MV/PV	GR	GR	GR	GROUND(5)	
Pilot valve operator	PV	1	1	Y79B PV	PV (1)	
Burner ground connection	GND (BURNER)	GR	GR	GR	GROUND	
Transformer secondary (unswitched leg)	24V GND	GR	GR	GR	GROUND	
Transformer secondary (switched leg)	TH-W*	2a	Y79 THSb	2	TH-S (2)	
	24V*	No connection*	No connection*	No connection*	No connection*	
Flame sensor	SENSE*	4[e]	4[e]	4[e]	SENSE (4)[e]	
Pilot igniter	SPARK	IGN COIL	IGN COIL	IGN COIL	IGN COIL	It might be necessary to cut off Rajah connector and/or attach insulated quick connect.

a Discard wire between transformer and terminal 5 (G60) or 6 (G600); otherwise, use existing harness for wiring.
b Discard wires between Y79A and module as follows: Red to 3, Black to 2, White to GR. Discard wire between transformer and 6.
c Discard wires between Y79B and module as follows: White to 3, Black to 1, Brown to GR. Discard wire between transformer and 6.
d CSA code numbers (for example, CSA45A-600R) are equivalent to G600 and use the same wiring information tables.
e ***Important***

Remove black jumper quick connect from Sense terminal of S8610U1003; cut jumper wire at circuit board and discard.

*IF INSTALLATION DOES NOT INCLUDE VENT DAMPER WITH PLUG CONNECTION TO MODULE:
1. Leave vent damper plug on S8610U Module in position.
2. Use TH-W terminal.

*IF INSTALLATION INCLUDES VENT DAMPER WITH PLUG CONNECTION TO MODULE:
1. Replace S8610U Module vent damper plug with damper Molex connector.
2. Wire thermostat W wire to TH-W.
3. Run wire from switched leg of transformer secondary to both thermostat R and S8610 Module 24V terminals.

Table 8. Conversion from CAMSTAT, FENWAL or HSC to S8610U1003.

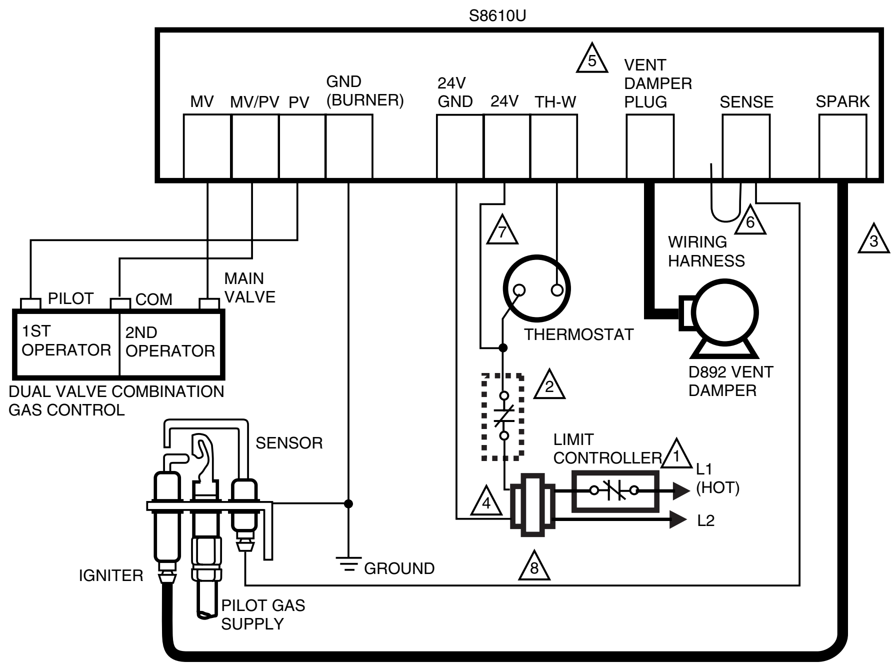
Terminal Function	Replacement Control	Old Control			Procedural Notes
	Honeywell S8610U1003	CAMSTAT IPI-24-00[a]	FENWAL 05-20X[b]	HSC 1003-3 and 1003-300[a]	
Main valve operator	MV	MV	MAIN VALVE	MV	—
Main valve and pilot common	MV/PV	GND	GROUND	GND/COM	Fenwal only: run separate lead to S8610 valve common terminal.
Pilot valve operator	PV	PV	PILOT VALVE	PV	—
Burner ground connection	GND (BURNER)	GND	—	—	To assure good ground, run separate wire from pilot burner to S8610 GND (BURNER).
Transformer secondary (unswitched leg)	24V GND	T2	GROUND	GND/COM	—
	24V	No connection	No connection	No connection	—
Transformer secondary (switched leg)	TH-W	T1	POWER	24 VAC	—
Flame sensor	SENSE	S[c]	—	SENSOR[c]	—
Pilot igniter	SPARK	IGN	H.V.	IGN COIL	Strip module end of ignition cable as necessary and attach insulated quick connect for connection to S8610.

a Use existing wiring harness to make connections to S8610.

b Tag all wires at module connector with terminal designations. Cut wires at connector, attach quick connects and connect to S8610; per table.

c ***Important***

Remove black jumper quick connect from Sense terminal of S8610U1003; cut jumper wire at circuit board and discard.



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
2. ALTERNATE LIMIT CONTROLLER LOCATION.
3. MAXIMUM CABLE LENGTH 3 ft (0.9m).
4. CONTROLS IN 24V CIRCUIT MUST NOT BE GROUND LEG TO TRANSFORMER.
5. REMOVE PLUG ONLY IF USING VENT DAMPER. FUSE BLOWS ON STARTUP WHEN PLUG IS REMOVED AND VENT DAMPER WIRING HARNESS IS INSTALLED; THEN MODULE OPERATES ONLY WHEN VENT DAMPER IS CONNECTED.
6. REMOVE JUMPER AND CONNECT SENSE TERMINAL ON TWO ROD APPLICATION ONLY.
7. IF THE VENT DAMPER IS CONNECTED, WIRE 24V TERMINAL, AS SHOWN. CONNECT VENT DAMPER CABLE IN PLACE OF PLUG SHIPPED WITH THE S8610U. IF NO VENT DAMPER IS CONNECTED, DO NOT WIRE 24V TERMINAL.
8. 30 VA MINIMUM WHEN VENT DAMPER IS CONNECTED TO DAMPER PLUG.

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Fig. 3. S8610U in heating system with atmospheric burner.

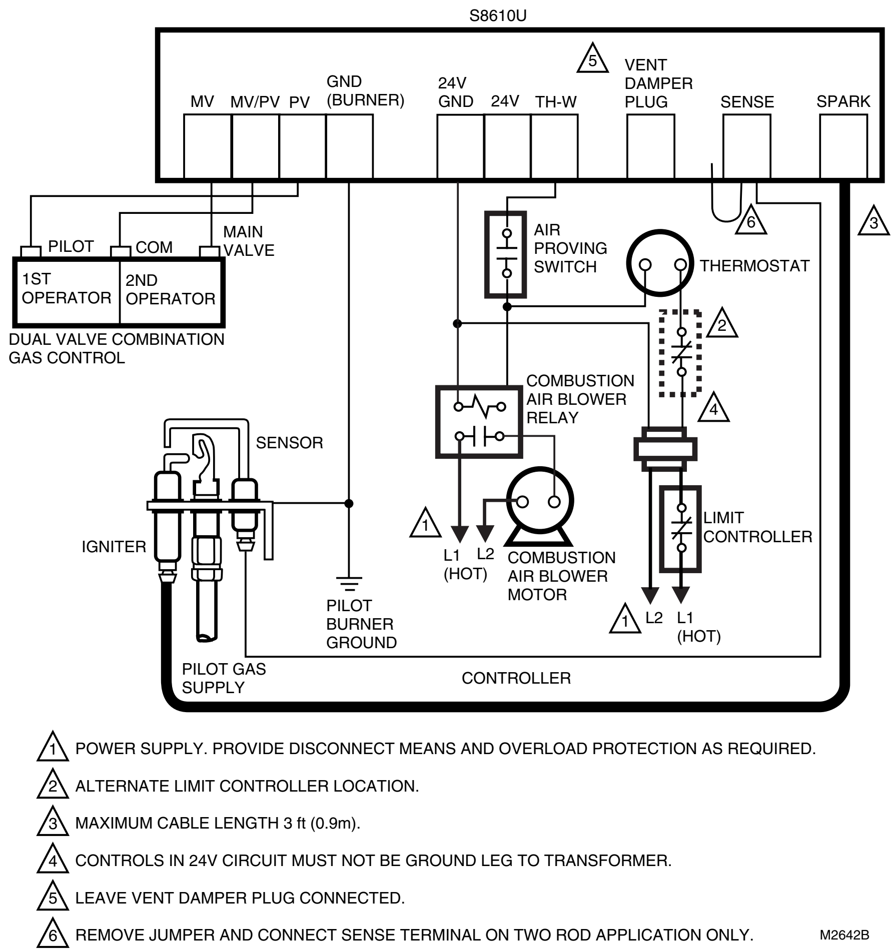


Fig. 4. S8610U in heating system with power-assisted combustion.

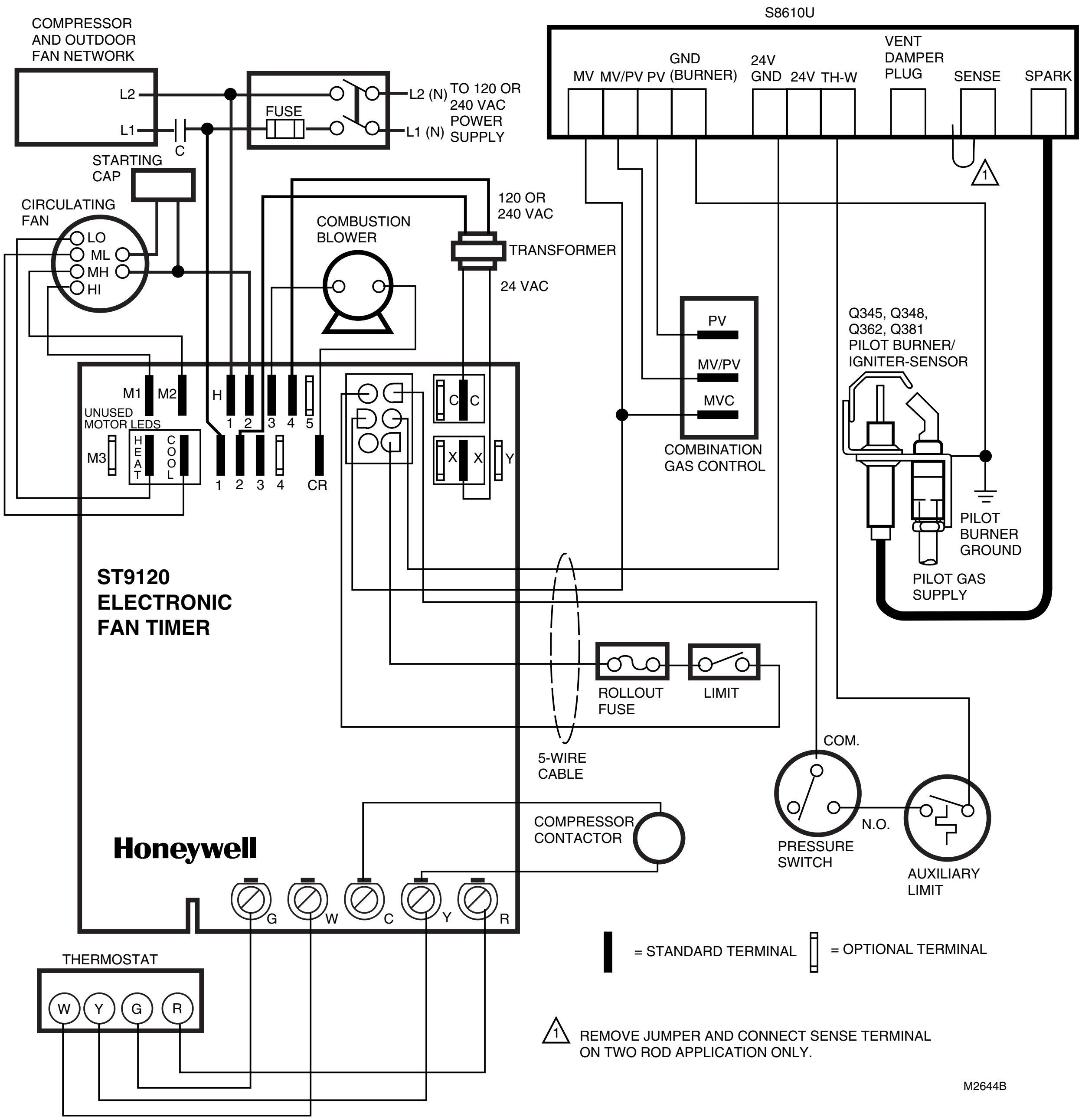


Fig. 5. S8610U in a typical ST9120 application.

STARTUP AND CHECKOUT

Check out the gas control system:
- At initial appliance installation.
- As part of regular maintenance procedures.
- At maintenance intervals determined by the application.
- As the first step in troubleshooting.
- Any time work is done on the system.

Maintenance frequency must be determined individually for each application. See Maintenance section.

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH.

1. If you smell gas or suspect a gas leak, turn off the gas at the manual service valve and evacuate the building. Do not try to light any appliance; do not touch any electrical switch or telephone in the building until you are sure no spilled gas remains.
2. Gas leak test must be done as described in steps 1 and 6 below on initial installation and anytime work is done involving the gas piping.

Step 1: Perform visual inspection.

a. With power off, make sure all wiring connections are clean and tight.
b. Turn on the power to the appliance.
c. Open the manual shutoff valves in the gas line to the appliance.
d. Test for gas leak before gas control if piping has been disturbed.

Gas Leak Test:
Paint the gas control gasket edges and all pipe connections downstream of the gas control, including pilot tubing connections, with a rich soap and water solution. Bubbles indicate gas leaks. Tighten the joints and screws or replace the component to stop the gas leak. Recheck with soap and water solution.

Step 2: Verify control system ground.
The igniter, flame sensor, and ignition module must share a common ground with the main burner. Use thermoplastic insulated wire with a minimum rating of 105°C (221°F) for the ground wire; asbestos insulation is not acceptable. If the temperature at the wire could exceed 105°C (221°F), use a shield to protect the wire from radiant heat generated by the burner. Connect the ground wire as follows:

a. Fit one end of the ground wire with a female 1/4 in. quick-connect terminal and connect it to the male quick-connect GND (BURNER) terminal on the ignition module.
b. Strip the other end of the wire and fasten it under the igniter bracket mounting screw. If necessary, use a shield to protect the ground wire from radiant heat.
c. The burner serves as the common grounding area. If there is not good metal-to-metal contact between the burner and ground, run a lead from the burner to ground.

NOTE: Earth ground is not required.

Step 3: Review normal operating sequence and module specifications.

a. See Operation and Specifications sections.

Step 4: Reset the module.

a. Turn the thermostat to its lowest setting.
b. Wait one minute.

As you do Steps 5 and 6, watch for points where operation deviates from normal. Refer to Troubleshooting Guide, Fig. 8, to correct the problem.

Step 5: Check safety shutoff operation.

a. Turn off the gas supply.
b. Set thermostat or controller above the room temperature to call for heat.
c. Watch for spark at pilot burner.
d. Time spark from start to shutoff. Spark should shut off after 90 seconds maximum. Ignition sequence repeats after five minutes minimum.
e. Open the manual gas control knob and make sure no gas is flowing to the pilot or main burner.
f. Set the thermostat below the room temperature and wait one minute before continuing.

Step 6: Check normal operation.

a. Set the thermostat or controller above the room temperature to call for heat.
b. Make sure the pilot lights smoothly when the gas reaches the pilot burner.
c. Make sure the main burner lights smoothly without flashback.
d. Make sure the burner operates smoothly without floating, lifting, or flame rollout to the furnace vestibule or heat buildup in the vestibule.
e. If the gas line was disturbed, complete the gas leak test.

Gas Leak Test:
Paint the gas control gasket edges and all the pipe connections downstream of the gas control, including pilot tubing connections, with a rich soap and water solution. Bubbles indicate gas leaks. Tighten the joints and screws or replace the component to stop the gas leak. Recheck with soap and water solution.

f. Turn the thermostat or controller below the room temperature. Make sure the main burner and pilot flames go out.

MAINTENANCE

⚠ WARNING

FIRE OR EXPLOSION HAZARD CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH.
Do not attempt to take the module apart or to clean it. Improper assembly and cleaning can cause unreliable operation.

Regular preventive maintenance is important in commercial cooking, agricultural and industrial industries applications that place a heavy load on system controls, because:

- In many such applications, particularly commercial cooking, the equipment operates 100,000 to 200,000 cycles per year. Such heavy cycling can wear out the gas control in one to two years.
- Exposure to water, dirt, chemicals and heat can damage the gas control and shut down the control system. A NEMA 4 enclosure can reduce exposure to environmental contaminants. See Electronic Ignition Service Manual, form 70-6604.

The maintenance program should include regular system checkout as outlined in the Startup and Checkout section, and control system checkout as described in appliance manufacturer literature.

Maintenance frequency must be determined individually for each application. Some considerations are:

- Cycling frequency. Appliances that can cycle 20,000 times annually should be checked monthly.
- Intermittent use. Appliances that are used seasonally should be checked before shutdown and again before the next use.
- Consequence of unexpected shutdown. Where the cost of an unexpected shutdown would be high, the system should be checked more often.
- Dusty, wet, or corrosive environment. Because these environments can cause the gas control to deteriorate more rapidly, the system should be checked more often.

Any control should be replaced if it does not perform properly on checkout or troubleshooting. In addition, replace any module if it is wet or looks like it has ever been wet. Protective enclosures as described in the Planning the Installation section are recommended, regardless of checkout frequency.

OPERATION

Module operation can be conveniently divided into two phases for the S8610:

- Trial for ignition.
- Main burner operation.

Fig. 6 summarizes the normal operating sequence of the module.

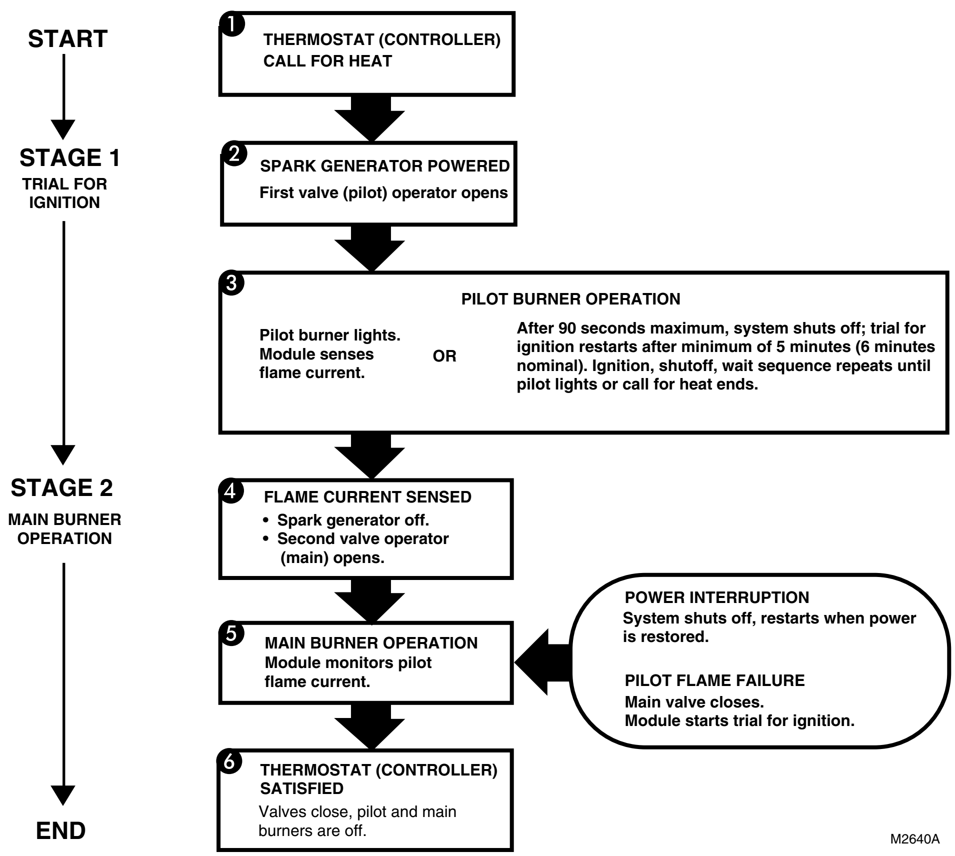


Fig. 6. S8610U normal operating sequence.

TROUBLESHOOTING

IMPORTANT

1. *The following service procedures are provided as a general guide. Follow appliance manufacturer service instructions if available.*
2. *Meter readings between gas control and ignition module must be taken within the trial for ignition period. Once the ignition module shuts off, wait for retry or reset at the thermostat.*
3. *If any component does not function properly, make sure it is correctly installed and wired before replacing it.*
4. *The ignition module cannot be repaired. If it malfunctions, replace it.*
5. *Only trained, experienced service technicians should service intermittent pilot systems.*
6. *After servicing, verify proper system operation.*

Perform the checkout steps in the Startup and Checkout section as the first step in troubleshooting. Then check the appropriate troubleshooting guide (Fig. 8) and the schematic diagram (Fig. 9) to determine the cause of the problem. If troubleshooting indicates an ignition problem, see Ignition System Checks section to isolate and correct the problem.

After troubleshooting, perform the checkout procedures again to be sure the system is operating normally.

Ignition System Checks

Step 1: Check ignition cable.

Make sure:

a. Ignition cable does not run in contact with any metal surfaces.
b. Ignition cable is no more than 36 in. (0.9m) long.
c. Connections to the ignition module and to the igniter or igniter-sensor are clean and tight.
d. Ignition cable provides good electrical continuity.

Step 2: Check ignition system grounding. Nuisance shutdowns are often caused by a poor or erratic ground.

a. A common ground, usually supplied by the pilot burner bracket, is required for the module and the pilot burner/igniter-sensor.
   - Check for good metal-to-metal contact between the pilot burner bracket and the main burner.
   - Check the ground lead from the GND (BURNER) terminal on the module to the pilot burner. Make sure connections are clean and tight. If the wire is damaged or deteriorated, replace it with No. 14 through 18 gauge, moisture-resistant, thermoplastic insulated wire with 105°C (221°F) minimum rating.
     — Check the ceramic flame rod insulator for cracks or evidence of exposure to extreme heat, which can permit leakage to ground. Replace pilot burner/igniter-sensor and provide a shield, if necessary.
     — If flame rod or bracket are bent out of position, restore to the correct position.

Step 3: Check spark ignition circuit. You will need a short jumper wire made from ignition cable or other heavily insulated wire.

a. Close the manual gas valve.
b. Disconnect the ignition cable at the SPARK terminal on the module.

⚠ WARNING

ELECTROCUTION HAZARD, CAN CAUSE SERIOUS INJURY OR DEATH.
When performing the following steps, do not touch stripped end of jumper or SPARK terminal. The ignition circuit generates over 10,000 volts and electrical shock can result.

c. Energize the module and immediately touch one end of the jumper firmly to the GND terminal on the module. Move the free end of the jumper slowly toward the SPARK terminal until a spark is established.
d. Pull the jumper slowly away from the terminal and note the length of the gap; when sparking stops, refer to the table as follows:

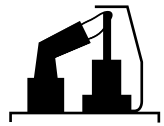
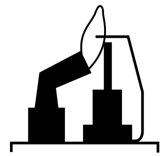
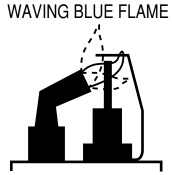
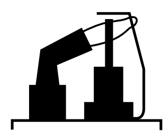
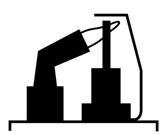
Arc Length	Action
No arc or arc less than 1/8 in. (3 mm).	Check external fuse, if provided. Verify power at module input terminal. Replace module if fuse and power are okay.
Arc 1/8 in. (3 mm) or longer.	Voltage output is okay.

STEP 4: Check pilot and main burner lightoff.

a. Set the thermostat to call for heat.
b. Watch the pilot burner during the ignition sequence to be sure:
   - Ignition spark continues after the pilot is lit.
   - The pilot lights and the spark stops, but the main burner does not light.
   - The pilot lights, the spark stops and the main burner lights, but the system shuts down.
c. If so, verify adequate flame current as follows:
   - Turn off the furnace at the circuit breaker or fuse box.
   - Clean the flame rod with an emery cloth.
   - Make sure the electrical connections are clean and tight. Replace the damaged wire with moisture-resistant No. 18 wire rated for continuous duty up to 105°C (221° F).
   - Check for a cracked ceramic insulator, which can cause short to ground, and replace igniter-sensor or sensor, if necessary.
   - At the gas control, disconnect the main valve wire from the TH or MV terminal.
   - Turn on the power and set the thermostat to call for heat. The pilot should light but the main burner remains off because the main valve actuator is disconnected.
   - Check the pilot flame. Make sure it is blue, steady, and envelops 3/8 to 1/2 in. (10 to 13 mm) of the flame rod. See Fig. 7 for possible flame problems and the causes.

- If necessary, adjust the pilot flame by turning the pilot adjustment screw on the gas control clockwise to decrease or counterclockwise to increase the pilot flame. Following adjustment, always replace the pilot adjustment cover screw and tighten firmly to assure proper gas control operation.
- Set the thermostat below the room temperature to end the call for heat.

d. Recheck ignition sequence as follows:
- Reconnect the main valve wire.
- Set the thermostat to call for heat.
- Watch the ignition sequence at the burner.
- If spark still does not stop after pilot lights, replace the ignition module.
- If the main burner does not light or if the main burner lights but system locks out, check module, ground wire, and gas control, as described in the Troubleshooting Guide, Fig. 8.

APPEARANCE	CAUSE
SMALL BLUE FLAME 	CHECK FOR LACK OF GAS FROM: • CLOGGED ORIFICE FILTER • CLOGGED PILOT FILTER • LOW GAS SUPPLY PRESSURE • PILOT ADJUSTMENT AT MINIMUM
LAZY YELLOW FLAME 	CHECK FOR LACK OF AIR FROM: • DIRTY ORIFICE • DIRTY LINT SCREEN, IF USED • DIRTY PRIMARY AIR OPENING, IF THERE IS ONE • PILOT ADJUSTMENT AT MINIMUM
WAVING BLUE FLAME 	CHECK FOR: • EXCESSIVE DRAFT AT PILOT LOCATION • RECIRCULATING PRODUCTS OF COMBUSTION
NOISY LIFTING BLOWING FLAME 	CHECK FOR: • HIGH GAS PRESSURE
HARD SHARP FLAME 	THIS FLAME IS CHARACTERISTIC OF MANUFACTURED GAS CHECK FOR: • HIGH GAS PRESSURE • ORIFICE TOO SMALL

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Fig. 7. Examples of unsatisfactory pilot flames.

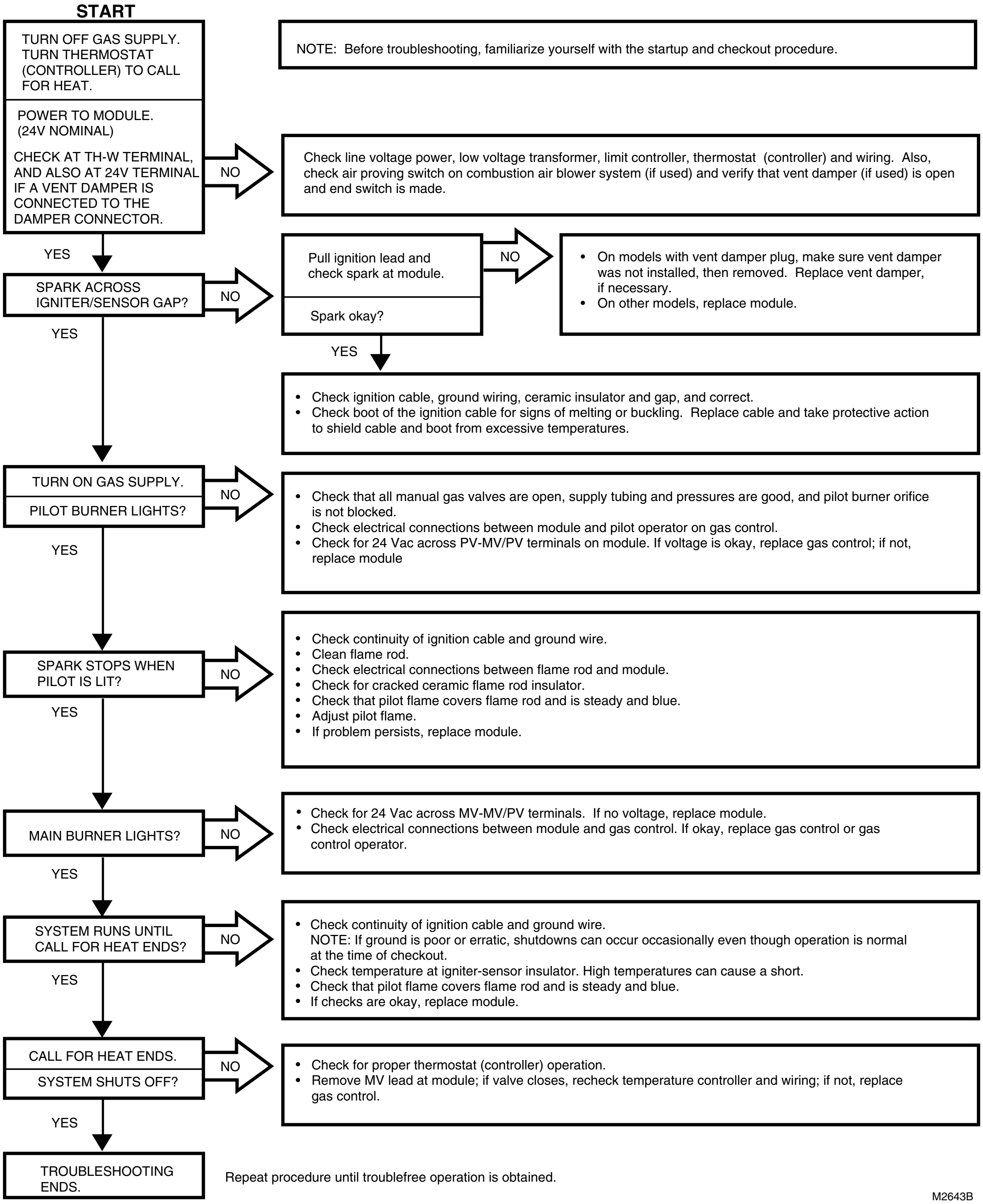
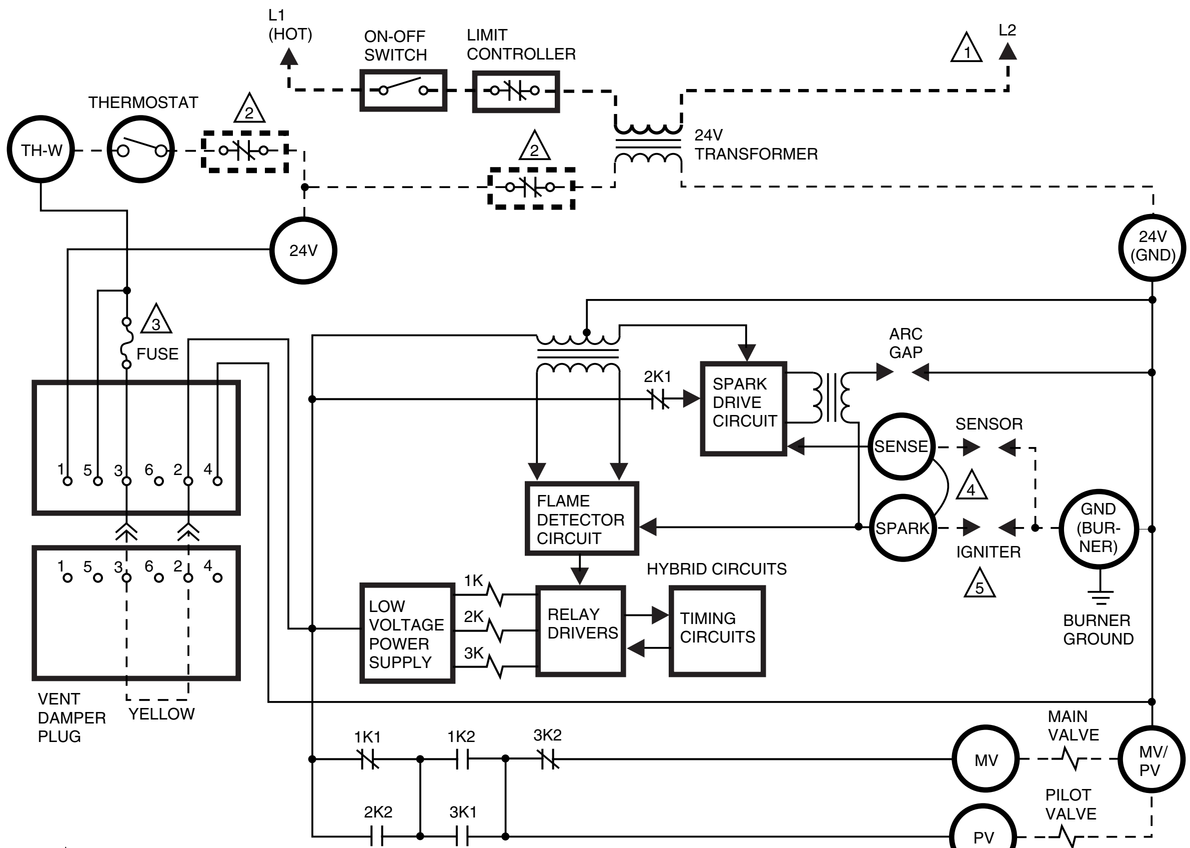


Fig. 8. S8610U Troubleshooting Guide.



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
2. ALTERNATE LIMIT CONTROLLER LOCATION.
3. 3 AMP NONREPLACEABLE FUSE. FUSE BLOWS WHEN VENT DAMPER IS PLUGGED IN AND POWER IS APPLIED.
4. SEPARATE SENSOR IS USED ON TWO-ROD SYSTEMS ONLY. DISCONNECT BLACK JUMPER WIRE FROM SENSE TERMINAL, CUT AT CIRCUIT BOARD AND DISCARD.
5. SINGLE ROD SYSTEM HAS IGNITER–SENSOR.

Fig. 9. Schematic for S8610U.

ANSI STANDARDS

Exhibit A
Recommended Procedure For Safety Inspection Of An Existing Appliance Installation As A Preliminary Step To Applying An Automatic Intermittent Pilot System

The following procedure is intended as a guide to aid in determining that an appliance is properly installed and is in a safe condition for continuing use.

This procedure is predicated on central furnace and boiler installations equipped with an atmospheric gas burner(s) and not of the direct vent type. It should be recognized that generalized test procedures cannot anticipate all situations. Accordingly, in some cases, deviation from this procedure may be necessary to determine safe operation of the equipment.

a. This procedure should be performed prior to any attempt at modification of the appliance or the installation.
b. If it is determined there is a condition which could result in unsafe operation, the appliance should be shut off and the owner advised of the unsafe condition.

The following steps should be followed in making the safety inspection:

1. Conduct a Gas Leakage Test of the appliance piping and control system downstream of the shutoff valve in the supply line to the appliance.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restrictions, leakage or corrosion or other deficiencies that could cause an unsafe condition.
3. Shut off all gas to the appliance and shut off any other fuel-burning appliance within the same room. Use the shutoff valve in the shutoff valve in the supply line to each appliance.
4. Inspect burners and crossovers for blockage and corrosion.
5. Applicable only to warm air heating appliances. Inspect heat exchangers for cracks, openings or excessive corrosion.
6. Applicable only to boilers. Inspect for evidence of water or combustion product leaks.
7. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliance is located and other spaces of the building. Turn on clothes dryers. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers. If, after completing steps 7 through 12, it is believed sufficient combustion air is not available, refer to 1.3.4 of the National Fuel Gas Code (Z223.1) for guidance.
8. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
9. a. Determine that the pilot is burning properly and that main burner ignition is satisfactory by interrupting and re-establishing the electrical supply to the appliance in any convenient manner.
10. Determine manifold pressure in order to match input after the new control is installed.
11. a. Visually determine that main burner gas is burning properly; i.e., no floating, lifting or flashback. Adjust the primary air shutter(s) as required.
    b. If appliance is equipped with high and low flame control or flame modulation, check for proper main burner operation at low flame.
12. Test for spillage at the draft hood relief opening after five minutes of main burner operation. Use a draft gauge, the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
13. Return doors, windows, exhaust fans, fireplace dampers and all other fuel-burning appliances to their previous conditions of use.
14. Applicable only to warm air heating appliances. Check both limit controller and fan controller for proper operation. Limit controller operation can be checked by temporarily disconnecting the electrical supply to the blower motor and determining that the limit control acts to shut off the main burner gas.
15. Applicable only to boilers:
    a. Determine that the circulating water pumps are in operating condition.
    b. Test low water cutoffs, automatic feed controls, pressure and temperature limit controls and relief valves in accordance with the manufacturer's recommendations and instructions to determine they are in operating condition.

Exhibit A Of ANSI Standard Z21.71 for Automatic Intermittent Pilot Ignition Systems for Field Installation.

Exhibit B
Procedure for Installing Automatic Intermittent Pilot Systems

Prior to beginning this procedure, a preliminary examination of the appliance and the automatic intermittent pilot system should be made to determine that the automatic intermittent pilot system can be properly applied to the appliance.

This procedure is intended as a guide to aid in safely installing a listed automatic intermittent pilot system on an existing listed appliance equipped with an atmospheric gas burner(s) and not of the direct vent type.

This procedure is based on the assumption that the history of the specific installation has been one of safe and satisfactory operation.

This procedure is predicated on central furnace and boiler installations, and it should be recognized that generalized procedures cannot anticipate all situations. Accordingly, in some cases, deviation from this procedure may be necessary to determine safe operation of the equipment.

The following steps should be followed in making the modifications:

1. Perform a safety inspection of the existing appliance installation. See Exhibit A for a recommended procedure for such a safety inspection.
2. Shut off all gas and electricity to the appliance. To shut off gas, use the shutoff valve in the supply line to the appliance. Do not use the shut-off valve which is provided as part of a combination control.
3. Install the automatic intermittent pilot system in strict accordance with the manufacturer’s installation instructions.
4. Turn on all gas and electricity to the appliance.
5. Determine that the appliance transformer has adequate capacity by following the steps outlined below:
   a. Compute the approximate current draw by adding the current draw of the automatic intermit-tent pilot system to (1) the current draw of the associated valving, and (2) the current draw of any relays or other devices operated by the transformer.
   b. Multiply the total current draw as computed above by 24V to determine the total volt-ampere (VA) required.
   c. The total VA required should be equal to or less than the VA rating of the transformer.
   d. If the total VA required is greater than the VA rating of the transformer, the transformer must be replaced with a Class 2 transformer of adequate rating.
6. Check the heat anticipator in the comfort thermostat to determine if it is properly adjusted to the current draw of the control system. Follow the thermostat manufacturer’s instructions.
7. Make certain wiring connections are tight and wires are positioned and secured so they will not be able to contact high temperature locations.
8. Conduct a Gas Leakage Test of the appliance piping and control system downstream of the shutoff valve in the supply line to the appliance.
9. a. Adjust the thermostat to its highest temperature setting, and test manifold pressure and adjust the pressure regulator to match original input as required (refer to Exhibit A, step 9b).
   b. Visually determine that main burner is burning properly; i.e., no floating, lifting or flashback. Adjust the primary air shutter(s) as required.
10. If the appliance is equipped with high and low flame control or flame modulation, check for proper main burner operation at both high and low flame.
11. Determine that the pilot is igniting and burning properly and that main burner ignition is satisfactory by interrupting and reestablishing the electrical supply to the appliance in any convenient manner. Make this determination with the appliance burner both cold and hot. Perform this step as many times as is necessary to satisfy yourself that the automatic intermittent pilot system is operating properly.
12. Test the pilot safety device (1) to determine if it is operating properly, and (2) for turndown characteristics according to the manufacturer’s installation instructions. No adjustments should be made other than those recommended by the system manufacturer.
13. Sequence the appliance through at least three operating cycles.
14. Applicable only to furnaces. Check both the limit controller and the fan controller for proper operation. Limit control operation can be checked by blocking the circulating air inlet or temporarily disconnecting the electrical supply to the blower motor and determining that the limit controller acts to shut off the main burner gas.
15. Applicable only to boilers:
    a. Determine that the circulating water pumps are in operating condition.
    b. Test low water cutoffs, automatic feed water controls, pressure and temperature limit controllers and relief valves in accordance with the manufacturer’s recommendation to determine they are in operating condition.
16. Add the labels (see 1.6.1-n and -o) on the appliance.

EXHIBIT B OF ANSI STANDARD Z21.71 FOR AUTOMATIC INTERMITTENT PILOT IGNITION SYSTEMS FOR FIELD INSTALLATION.

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